ACS-1803 Introduction to Information Systems

Instructor: Trevor Nadeau

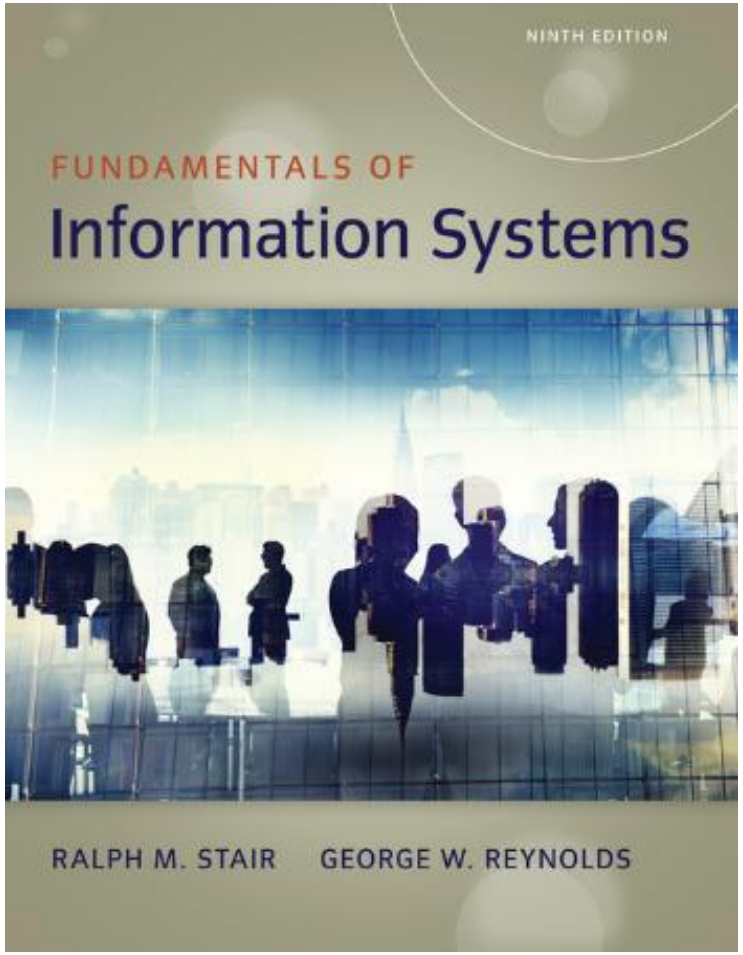
Introduction to Information Systems

Lecture Outline1

Introduction to Information Systems

- Instructor
  - Trevor Nadeau
  - t.nadeau@uwinnipeg.ca

- Textbook
  - Ralph Stair and George Reynolds: *Fundamentals of Information Systems, Ninth Edition.*



Principles and Learning Objectives

- **The value of information is directly linked to how it helps decision makers achieve the organization's goals**

  - Distinguish data from information and describe the characteristics used to evaluate the quality of data

Principles and Learning Objectives

- **Knowing the potential impact of information systems and having the ability to put this knowledge to work can result in a successful personal career, organizations that reach their goals, and a society with a higher quality of life**

  - Identify the basic types of business information systems and discuss who uses them, how they are used, and what kinds of benefits they deliver

Principles and Learning Objectives

- **System users, business managers, and information systems professionals must work together to build a successful information system**
  - Identify the major steps of the systems development process and state the goal of each

Principles and Learning Objectives

- **The use of information systems to add value to the organization can also give an organization a competitive advantage**
  - Identify the value-added processes in the supply chain and describe the role of information systems within them
  - Identify some of the strategies employed to lower costs or improve service
  - Define the term competitive advantage and discuss how organizations are using information systems to gain such an advantage

Principles and Learning Objectives

- **IS personnel is a key to unlocking the potential of any new or modified system**
  - Define the types of roles, functions, and careers available in information systems

Why Learn About Information Systems in Organizations?

- **Information systems used by:**
  - Sales representatives
  - Managers
  - Financial advisors

- **Information systems:**
  - Indispensable tools to help you achieve your career goals
  - Businesses can use information systems to increase revenues and reduce costs

Information Concepts

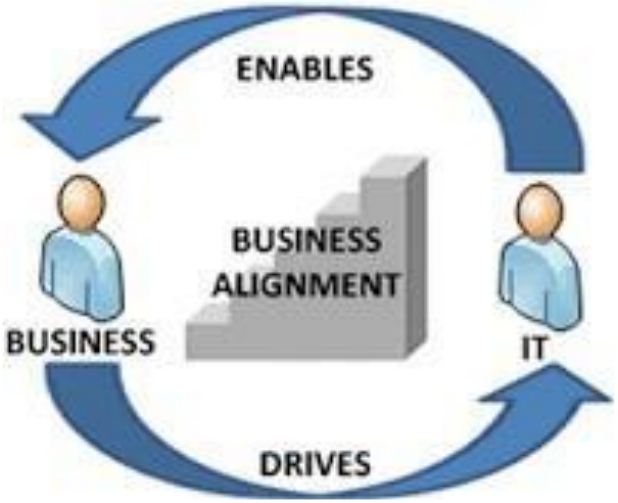
- **Information system (IS):**
  - A set of interrelated components that collect, manipulate, and disseminate data and information and provide feedback to meet an objective

Information Concepts

- **Information:**
  - One of an organization's most valuable resources
  - Often confused with the term data
- Future (Microsoft 2019)

The Role of Information Systems in Business Today

- **New products, services, and business models:**
  - Business model: describes how company produces, delivers, and sells product or service to create wealth
  - Information systems and technology a major enabling tool for new products, services, business models



The Role of Information Systems in Business Today

- **Customer and supplier intimacy:**
  - Serving customers well leads to customers returning, which raises revenues and profits.
    - Example: High-end hotels that use computers to track customer preferences and used to monitor and customize environment
  - Intimacy with suppliers allows them to provide vital inputs, which lowers costs.
    - Example: Wal-Mart's Information System which links sales records to contract manufacturer

The Role of Information Systems in Business Today

- **Improved decision making**
  - Without accurate information:
    - Managers must use forecasts, best guesses, luck
    - Results in:
      - Overproduction, underproduction
      - Misallocation of resources
      - Poor response times
    - Poor outcomes raise costs, lose customers

Example: Verizon's Web-based digital dashboard to provide managers with real-time data on customer complaints, network performance, line outages, and so on

The Role of Information Systems in Business Today

- **Operational excellence:**
  - Improvement of efficiency to attain higher profitability
  - Information systems, technology an important tool in achieving greater efficiency and productivity
  - Walmart's Retail Link system links suppliers to stores for superior replenishment system

The Role of Information Systems in Business Today

- **Competitive advantage**
  - Delivering better performance
  - Charging less for superior products
  - Responding to customers and suppliers in real time
  - **Examples: Apple, Walmart, UPS**

Data, Information, and Knowledge

- **Data:**
  - Raw facts
- **Information:**
  - Collection of facts organized in such a way that they have value beyond the facts themselves
- **Process:**
  - Set of logically related tasks
- **Knowledge:**
  - Awareness and understanding of a set of information

Data, Information, and Knowledge

Data	Represented by
Alphanumeric data	Numbers, letters, and other characters
Image data	Graphic images and pictures
Audio data	Sound, noise, or tones
Video data	Moving images or pictures

Table 1.1

Types of Data

Data, Information, and Knowledge

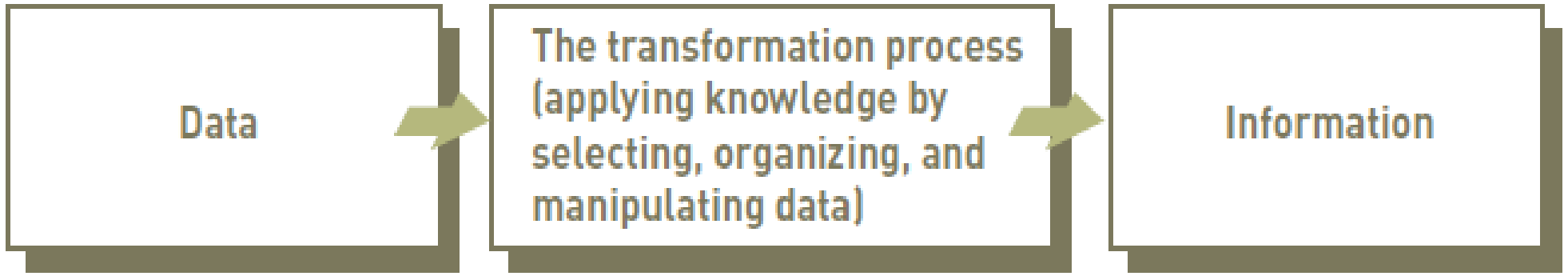


Figure 1.2

The Process of Transforming Data into Information

The Characteristics of Valuable Information

- **If an organization's information is not accurate or complete:**
  - People can make poor decisions, costing thousands, or even millions, of dollars
- **Depending on the type of data you need:**
  - Some characteristics become more important than others

The Characteristics of Valuable Information

Characteristics	Definitions
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. (This is commonly called garbage in, garbage out (GIGO).)
Complete	Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.
Economical	Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it.
Flexible	Flexible information can be used for a variety of purposes. For example, information on how much inventory is on hand for a particular part can be used by a sales representative in closing a sale, by a production manager to determine whether more inventory is needed, and by a financial executive to determine the total value the company has invested in inventory.

The Characteristics of Valuable Information (con't)

Characteristics	Definitions
Relevant	Relevant information is important to the decision maker. Information showing that lumber prices might drop might not be relevant to a computer chip manufacturer.
Reliable	Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up might not be reliable.
Secure	Information should be secure from access by unauthorized users.
Simple	Information should be simple, not overly complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important.
Timely	Timely information is delivered when it is needed. Knowing last week's weather conditions will not help when trying to decide what coat to wear today.
Verifiable	Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information.

The Value of Information

- **Directly linked to how it helps decision makers achieve their organization's goals**
- **Valuable information:**
  - Can help people and their organizations perform tasks more efficiently and effectively

What is an Information System?

- **Information system (IS) is a set of interrelated elements that:**
  - Collect (input)
  - Manipulate (process)
  - Store
  - Disseminate (output) data and information
  - Provide a corrective reaction (feedback mechanism) to meet an objective

Input, Processing, Output, Feedback

- **Input:**
  - Activity of gathering and capturing raw data
- **Processing:**
  - Converting data into useful outputs
- **Output:**
  - Production of useful information, usually in the form of documents and reports
- **Feedback:**
  - Information from the system that is used to make changes to input or processing activities

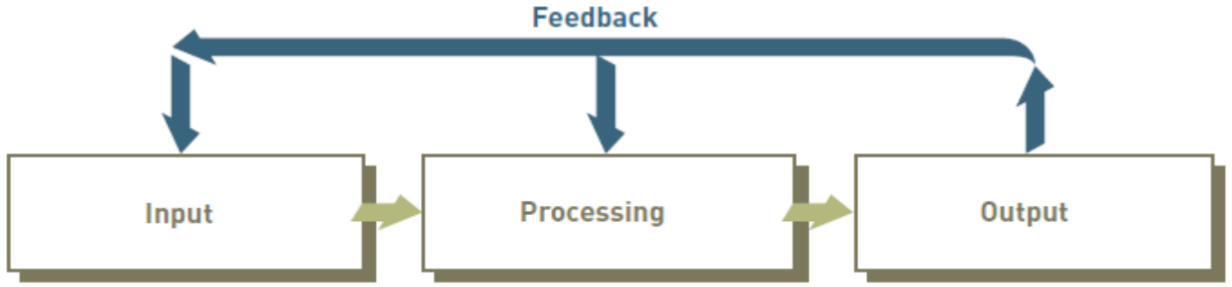


Figure 1.5

The Components of an Information System

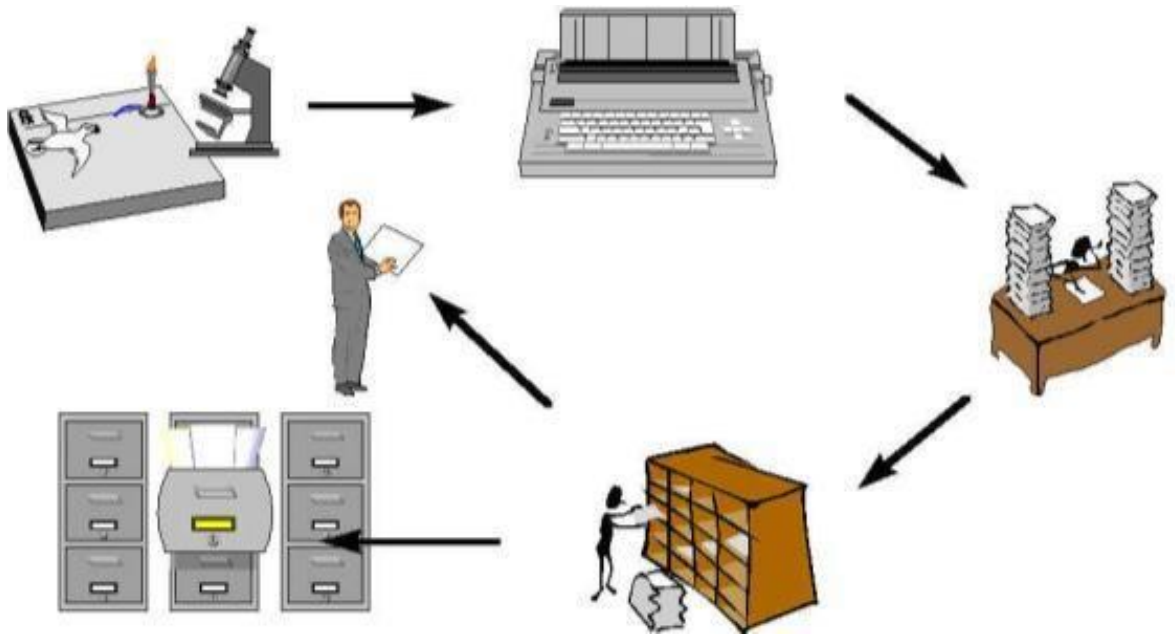
Feedback is critical to the successful operation of a system.

Computer Information Systems – Component Groups

- **Application Components (Application Software, Databases)**
  - Outer: menu screens, input screens, query screens, reports
  - Application components are most directly related to the business situation that the system supports
- **Technical Components (Hardware, Telecommunications)**
  - Hardware, system software, telecommunication technology (ICT – information and communication technology) – this is the back
  - These "house" the application components
- **Organizational Components (People, Processes)**
  - Who does what, Where, and How with this system, in the organization? (procedures)

Manual and Computer-based Information Systems

- **An information system can be:**
  - Manual or computerized



Manual and Computer-based Information Systems

- **Example:**
  - Investment analysts manually draw charts and trend lines to assist them in making investment decisions
- **Computer-based Information Systems (CBIS) or Management Information Systems (MIS):**
  - Follow stock indexes and markets and suggest when large blocks of stocks should be purchased or sold

Information Systems - Elements

- Hardware:
  - Consists of computer equipment used to perform input, processing, and output activities
- Software:
  - Consists of the computer programs that govern the operation of the computer
- Database:
  - Organized collection of facts and information, typically consisting of two or more related data files

Information Systems - Elements

- Telecommunication, Networks, and the Internet:
  - The electronic transmission of signals for communications
  - Networks: Connect computers and equipment to enable electronic communication
- People:
  - The most important element in most management information systems
- Procedures:
  - Include strategies, policies, methods, and rules for using the MIS
  - Procedure defines the steps to follow to achive a specific end result
    - Such as enter a customer order, pay a supplier invoice, or request a current inventory report
  - Using a CBIS involves setting and following many procedures, including those for the
    - Operation, maintenance, and security of the system

Components of a Computer-based Information System (CBIS)

- **Single set of hardware, software, databases, telecommunications, people, and procedures:**
  - Composed of Application, Technical, and Organizational components
  - Configured to collect, manipulate, store, and process data into information

Three Fundamental Types of Information Systems

- Information systems can be divided into three types:
  - **Personal IS** – includes information systems that improve the productivity of individual users
  - **Group IS** –includes information systems that improve communications and support collaboration among members of a workgroup
  - **Enterprise IS** – includes information systems that organizations use to define structured interactions among their own employees and/or external customers, suppliers, government agencies, etc…

Three Fundamental Types of Information Systems

- For each type of IS, certain key organizational complements must be in place:
  - Well-trained workers
  - System support
  - Better teamwork
  - Redesigned processes
  - New decision rights

Three Fundamental Types of Information Systems

TABLE 1.3 Examples and characteristics of each type of information system

	Personal IS	Group IS	Enterprise IS
Examples	Personal productivity software, decision-support system	Email, instant messaging, project management software	Transaction processing systems, enterprise systems, interorganizational systems
Benefits	Improved productivity	Increased collaboration	Increased standardization and ability to monitor work
Organizational complements (including well-trained workers, better teamwork, redesigned processes, and new decision rights)	• Does not bring complements with it • Partial benefits can be achieved without all complements being in place	• At least some complements must be in place when IS "goes live" • Allows users to implement and modify complements over time	• Full complements must be in place when IS "goes live"
Manager's role	• Ensure that employees understand and connect to the change • Encourage use • Challenge workers to find new uses	• Demonstrate how technology can be used • Set norms for participation	• Identify and put into place the full set of organizational complements prior to adoption • Intervene forcefully and continually to ensure adoption

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End of Lecture 1